

# Drinking Water Source Protection Workshop

*Opportunities for Planning and Implementation*

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# DES Regulations for Source Water Protection

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# What is Source Water Protection?

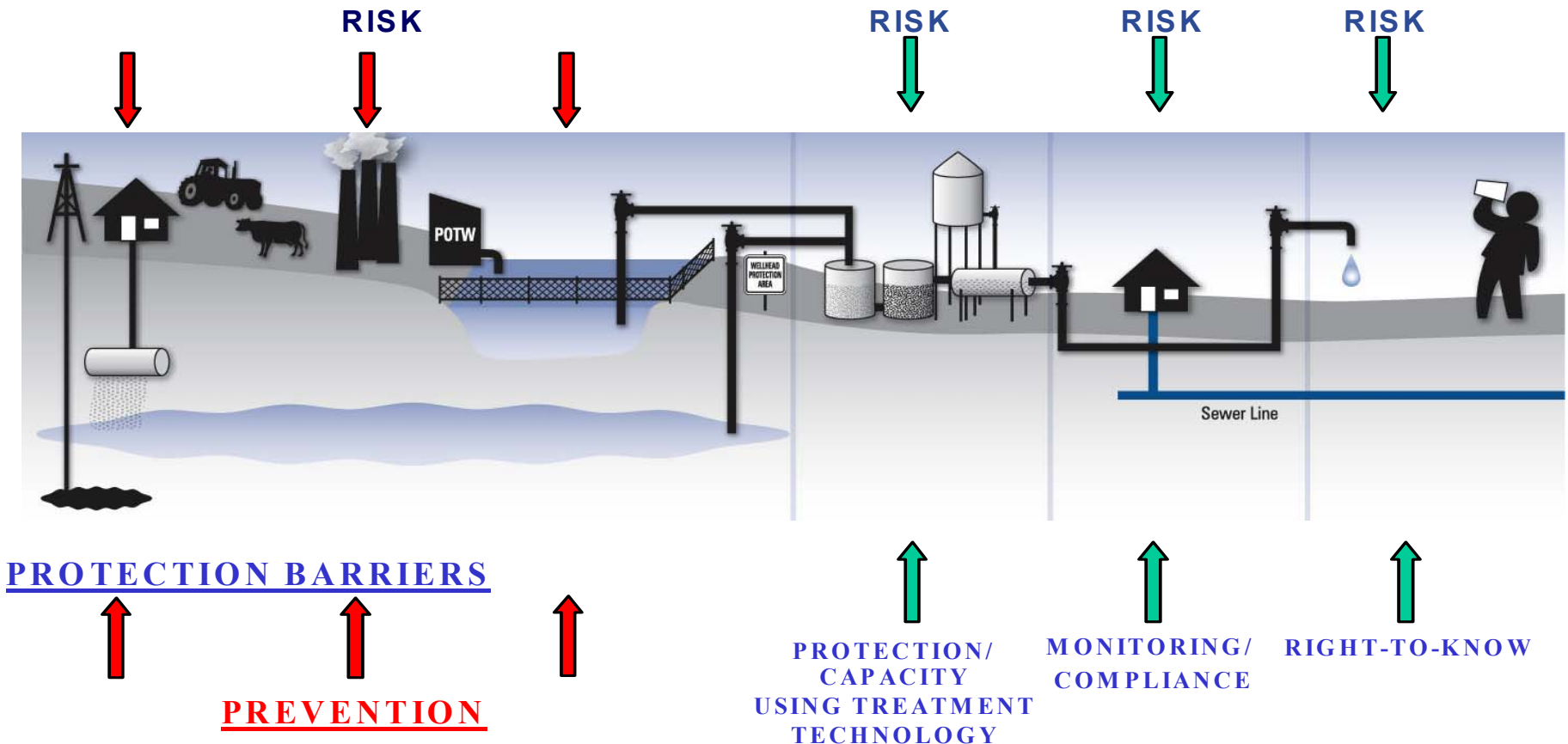
## IT'S ALL ABOUT PREVENTION !

- ◆ Preventing contaminants that can adversely affect human health from entering a source of water for a public water supply
- ◆ Preventing the development of water supplies in areas that are or may be contaminated
- ◆ Preventing new groundwater withdrawals from impacting water resources or water users

# The Multiple Barrier Approach

SAFE DRINKING WATER

*MULTIPLE RISKS REQUIRE MULTIPLE BARRIERS*



# How is Drinking Water Protected Through State Regulations?

- ◆ *What laws and regulations are in place to protect drinking water?*
- ◆ *How are these laws and regulations implemented?*
- ◆ *Who is responsible for implementing the laws and regulations?*



# Laws Governing Source Water Protection

- 1) NH Safe Drinking Water Act - RSA 485  
[www.gencourt.state.nh.us/rsa/html/indexes/485.html](http://www.gencourt.state.nh.us/rsa/html/indexes/485.html)
- 2) NH Groundwater Protection Act - RSA 485-C  
[www.gencourt.state.nh.us/rsa/html/indexes/485-C.html](http://www.gencourt.state.nh.us/rsa/html/indexes/485-C.html)
- 3) Water Pollution and Waste Disposal –  
RSA 485-A [www.gencourt.state.nh.us/rsa/html/L/485-A/485-A-13.htm](http://www.gencourt.state.nh.us/rsa/html/L/485-A/485-A-13.htm)

# Source Water Protection Regulations

([www.des.state.nh.us/dwspp/rules.htm](http://www.des.state.nh.us/dwspp/rules.htm))

## Community Well Siting Regulations

Env-Ws 378 Site Selection of Small Production Wells  
for Community Water Systems

Env-Ws 379 Site Selection of Large Production Wells  
for Community Water Systems

## Regulations for Potential Contamination Source Management in Water Supply Recharge Areas

Env-Ws 421 Best Management Practices

# Source Water Protection Regulations (continued)

## Regulations for Managing Impacts Associated with New Large Groundwater Withdrawals

- Env-Ws 387 Minor Large Groundwater Withdrawal
- Env-Ws 388 Major Large Groundwater Withdrawal

## Regulations for Managing the Proper Treatment and Disposal of Wastewater Onto or Into the Ground

- Env-Ws 1500 Groundwater Discharge Permitting  
and Registration
- Env-Ws 384 Underground Injection Control Rule

# What Type of Groundwater Withdrawals Must Comply With Source Water Protection Regulations?

- 1) New withdrawals from small (<40 gpm) production wells for community water systems (Env-Ws 378)
- 2) New withdrawals from large (>40 gpm) production wells for community water systems (Env-Ws 379)
- 3) New withdrawals for bottled water (Env-Ws 389)
- 4) All withdrawals from wells installed after July 1998 that exceed 57,600 gallons over any 24-hour period (>40 gpm) (Env-Ws 387 & 388 – Minor or Major Large Groundwater Withdrawals)

# What Type of Groundwater Withdrawals Are Not Regulated By NH State Law?

- ◆ Withdrawals for non-potable uses <57,600 gallons/day<sup>1</sup>
- ◆ All withdrawals established prior to August 1998 for non-potable uses
- ◆ Domestic wells <57,600 gallons/day (virtually all domestic wells)

Community water systems with water supplies developed prior to Source Water Protection regulations are not forced to comply with these regulations (there are incentives however). These water systems are required to comply with other public water system regulations.

1. Any withdrawal, transfer, or discharge of water that exceeds 20,000 gallons per day must register and report water usage to the Department.

## Well Siting Regulations for Community Water Systems

"Community water system" means "community water system" as defined in RSA 485:1-a, I, namely "a public water system which services at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents."

# Well Siting Regulations for Community Water Systems

## Objective

Establishes procedures and standards for the development of new production wells for community water systems in order to ensure that these wells will be capable of consistently producing an adequate supply of water that meets drinking water quality standards

## Regulation

**Env-Ws 378** – Site Selection for Small Production Wells (<57,600 gallons/day) for Community Water Systems. Small production wells are generally developed for small community water systems serving less than 1000 people without fire suppression. Wellhead protection area is generally a circle.

**Env-Ws 379** – Site Selection for Large Production Wells (>57,600 gallons/day) for Community Water Systems. Wellhead Protection Area is determined through extensive testing.

# Community Water Supply Location Requirements for New Wells

- ◆ 50 feet setback from surface water
- ◆ Wellhead must be above the 100 year floodplain elevation
- ◆ 150-400 feet around the wellhead is in a natural state and owned or legally controlled by the water system

# Small Community Well Siting Procedure(Env-Ws 378)

## 1)Submit Preliminary Application

- a) Demonstrate compliance with well siting criteria
- b) Delineate preliminary wellhead protection area(usually fixed radius)
- c) Identify existing contamination sources
- d) Identify potential contamination sources (PCS)
- e) Propose withdrawal and water quality testing program

## 2)Conduct Withdrawal Testing Program (48-72 hours)

## 3)Submit Final Report

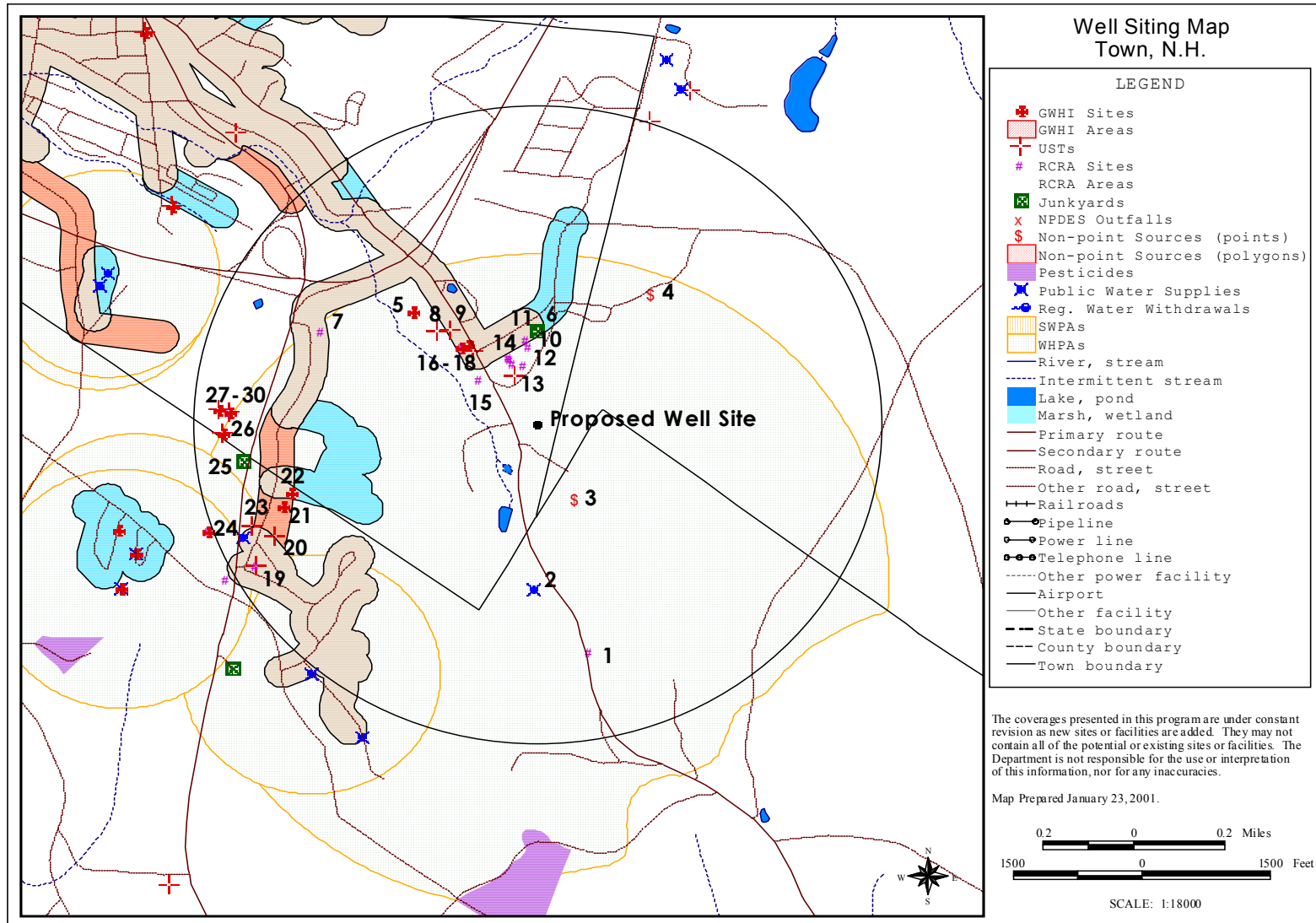
- a) Demonstrate yield of wells meets regulatory standards  
(Env-Ws 372 - [www.des.state.nh.us/rules/env-ws372.pdf](http://www.des.state.nh.us/rules/env-ws372.pdf))
- b) Refine wellhead protection area
- c) Update inventory of potential contamination sources
- d) Develop a Source Water Protection Program – Mailing of Educational Material every three years to everyone in the WHPA
- e) Report water quality testing results

**\*\*No formal role for municipal notification in the review process, but DES copies and coordinates with interested municipalities upon request\*\***

# Steps to Developing an Inventory of Potential Contamination Sources

- 1) Obtain a map of the primary inventory of potential and existing sources of groundwater contamination by contacting the N.H. Department of Environmental Services at 271-7017, or create your own map online at [www.des.state.nh.us/gis/onestop](http://www.des.state.nh.us/gis/onestop).**
- 2) Conduct a "windshield survey." This consists of driving or walking through the source water protection area to see if any businesses or activities can be taken off or added to the preliminary inventory of PCSs and to verify the locations of the PCSs.**
- 3) Check local sources of information.**
  - Tax records**
  - Local code enforcement officer**
  - Health officer**
  - Fire officials**

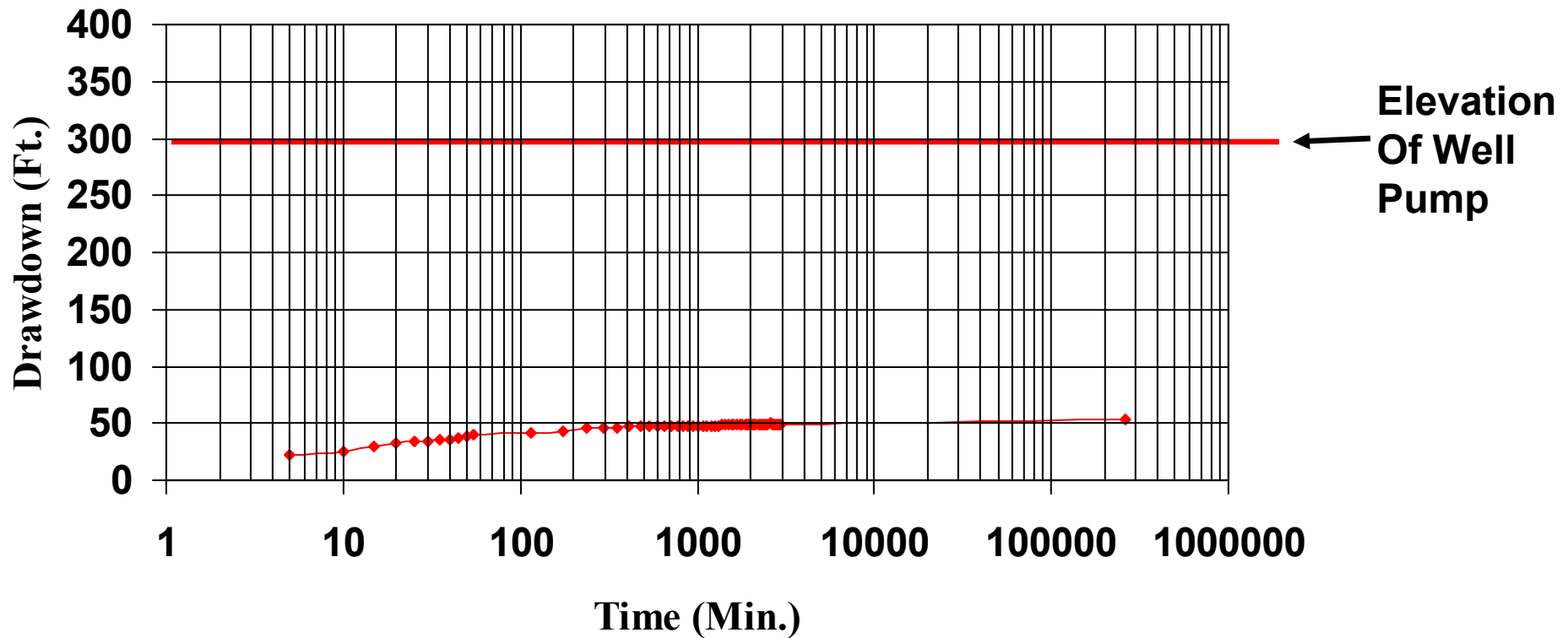
# Determination of Potential Contamination Sources



# Determining A Reliable Well Yield

## Analysis of Pump Test Data

### 180-Day Drawdown Plot

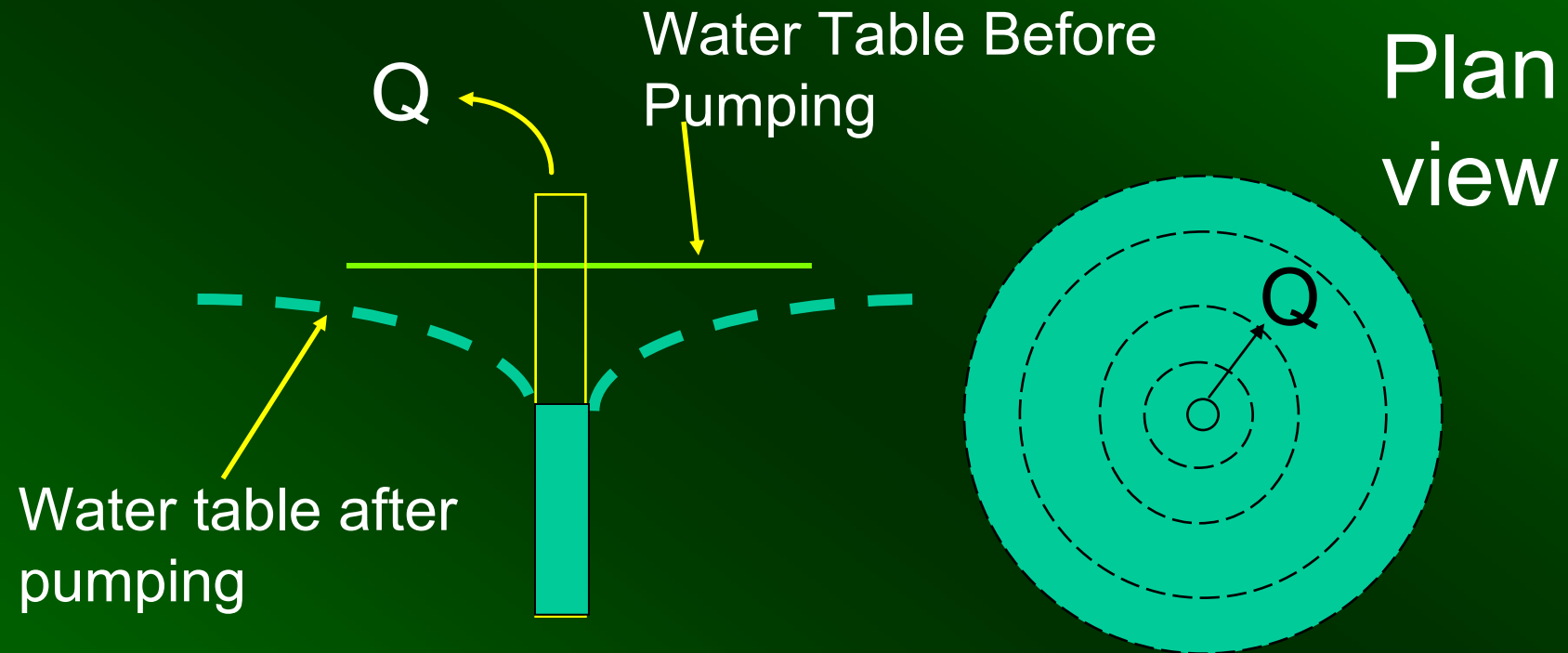


# General Large Community Well Siting Process (Env-Ws 379)

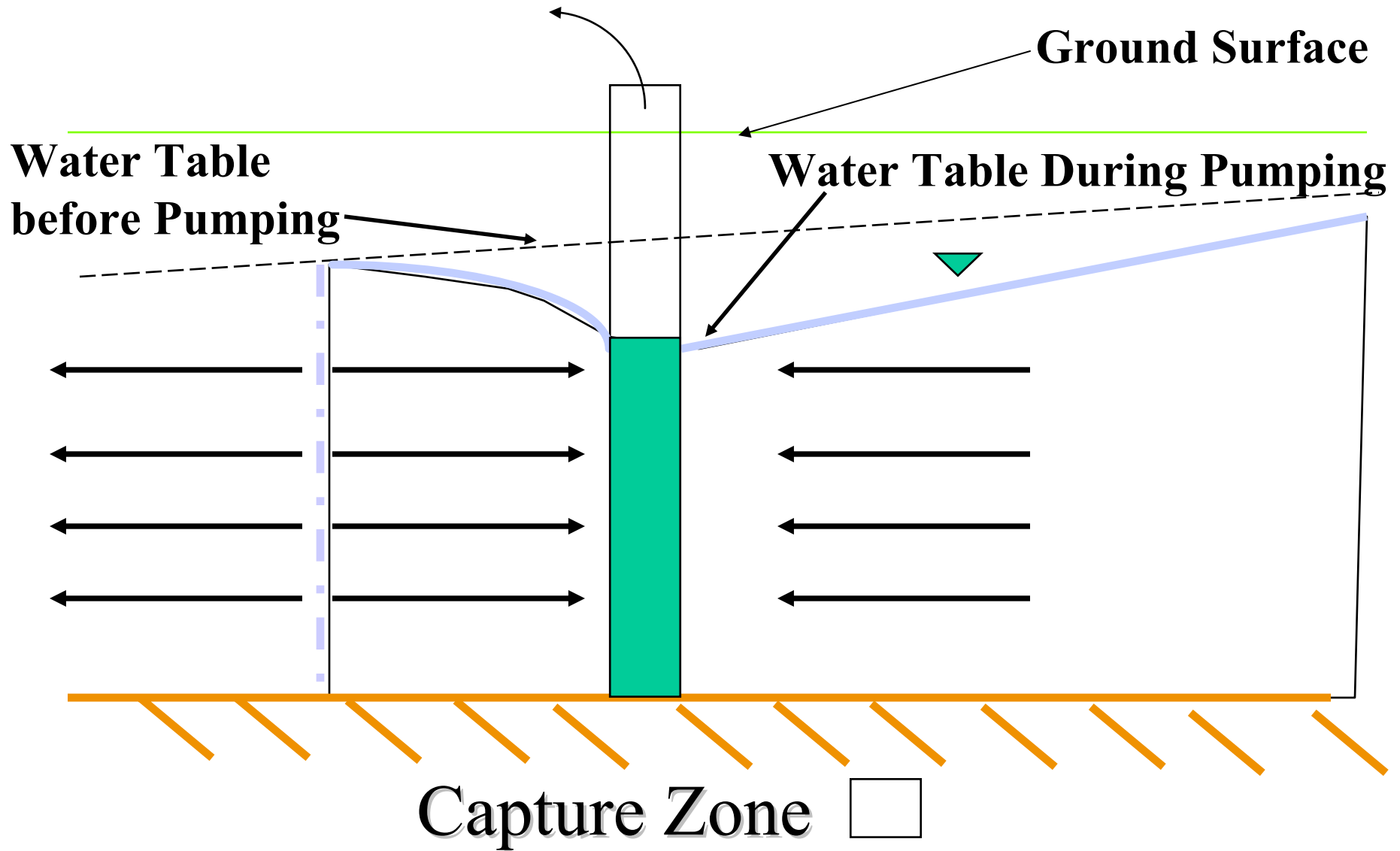
Same as Small Community Well Siting (Env-Ws 378) except:

- 1) Professional Engineers or Geologists need to complete the work
- 2) Much more extensive withdrawal testing requirements (duration, number of monitoring points)
- 3) Additional water quality sampling requirements
- 4) Actual recharge area (well head protection area) of the well must be delineated
- 5) Water system is required to inspect potential contamination sources once every three years
- 6) An additional permit is required-Large Groundwater Withdrawal Permit

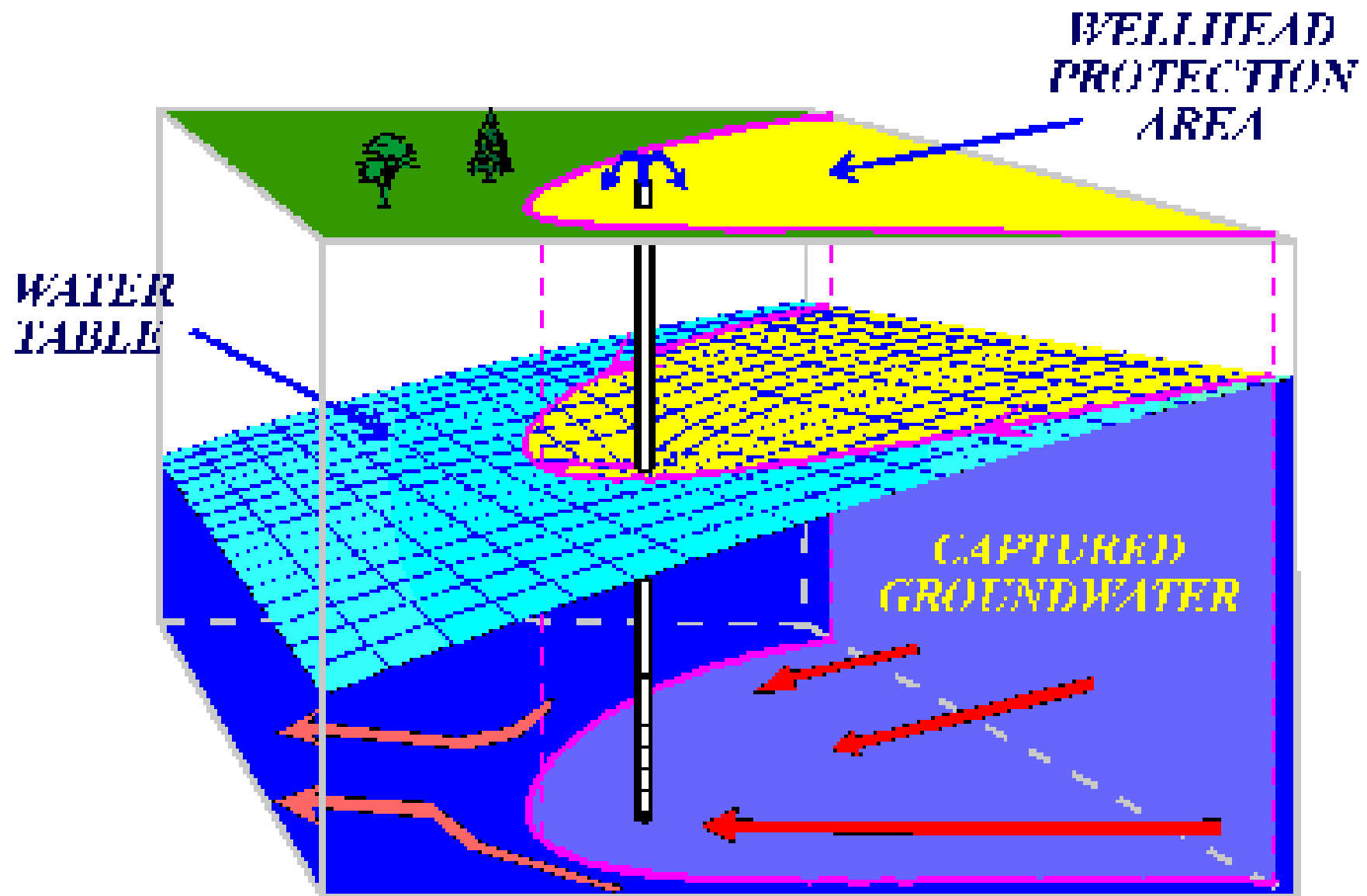
# Determining the Wellhead Protection Area



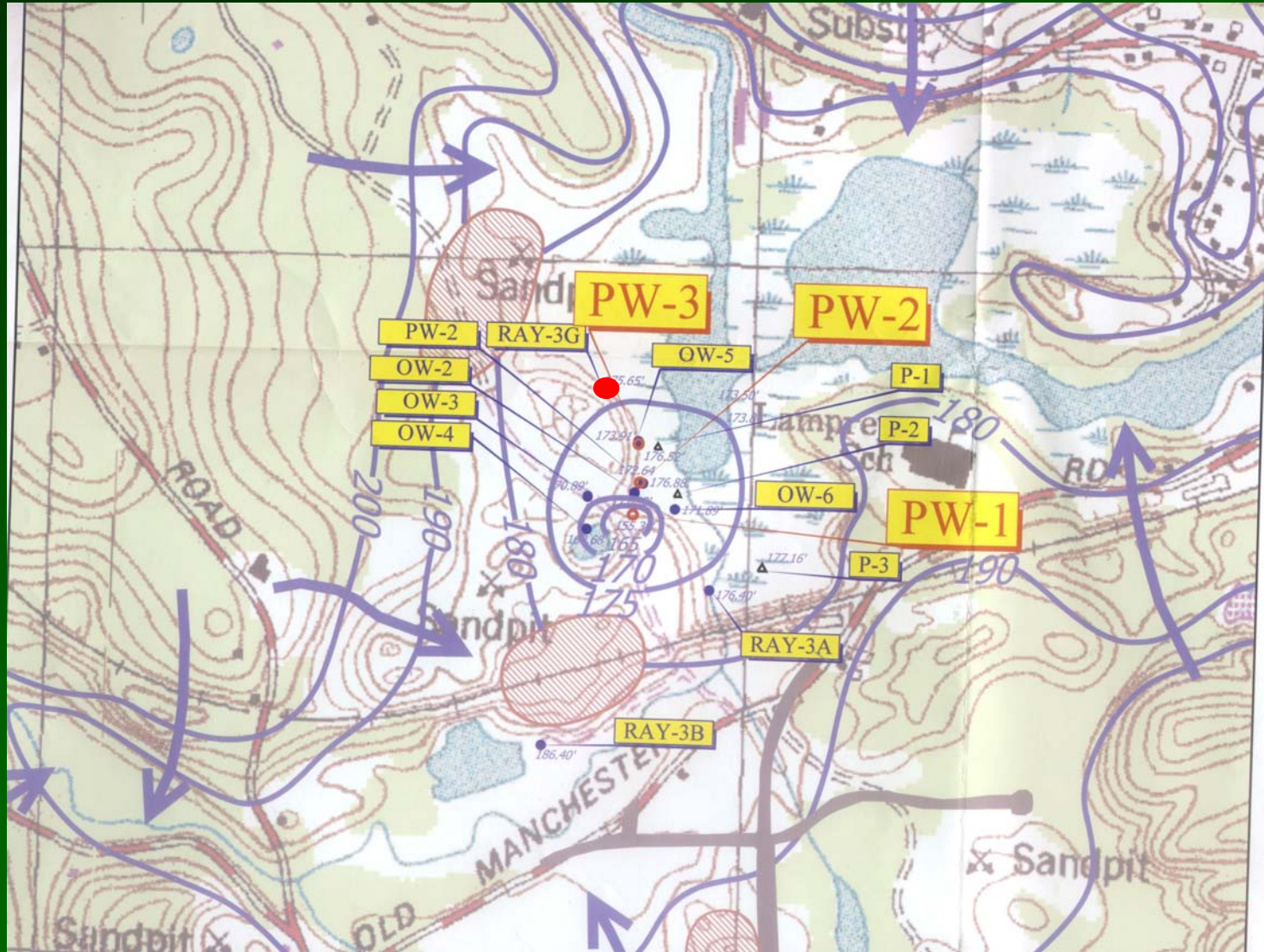
# Capture Zone in Cross-Section



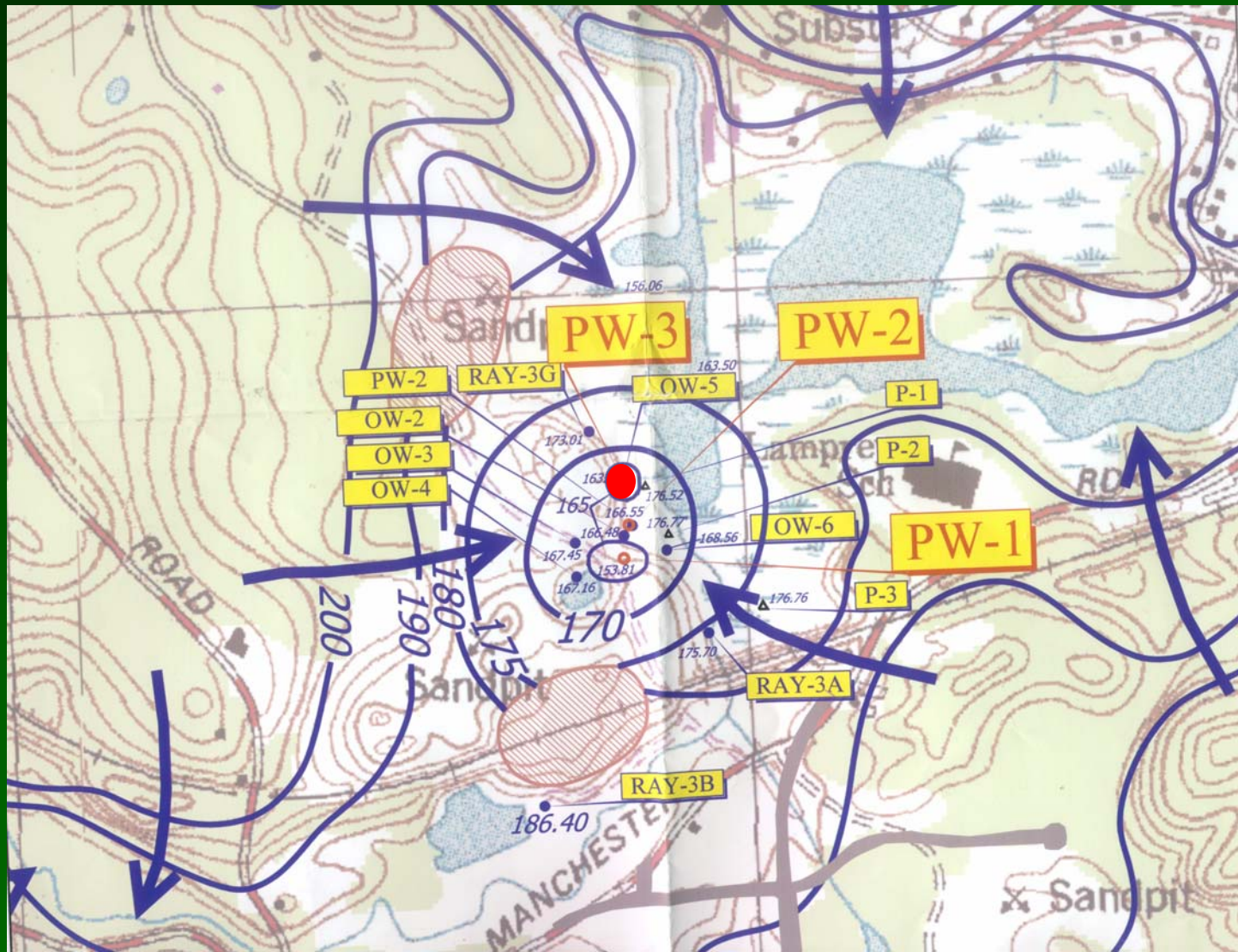
# WELLHEAD PROTECTION AREA



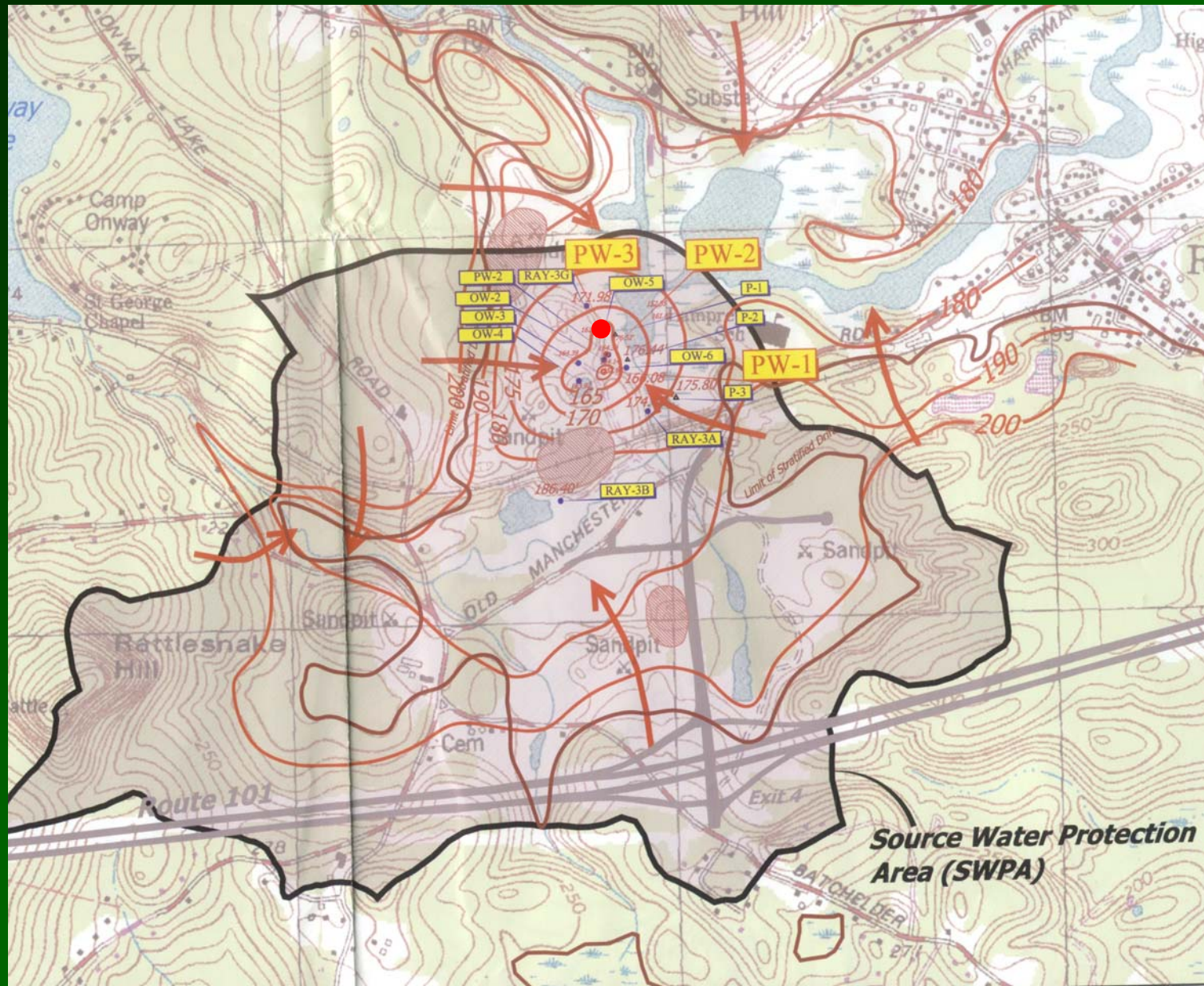
# Example of Delineating a Capture Zone/ Wellhead Protection Area New Well PW-3 – Pre-pumping Conditions



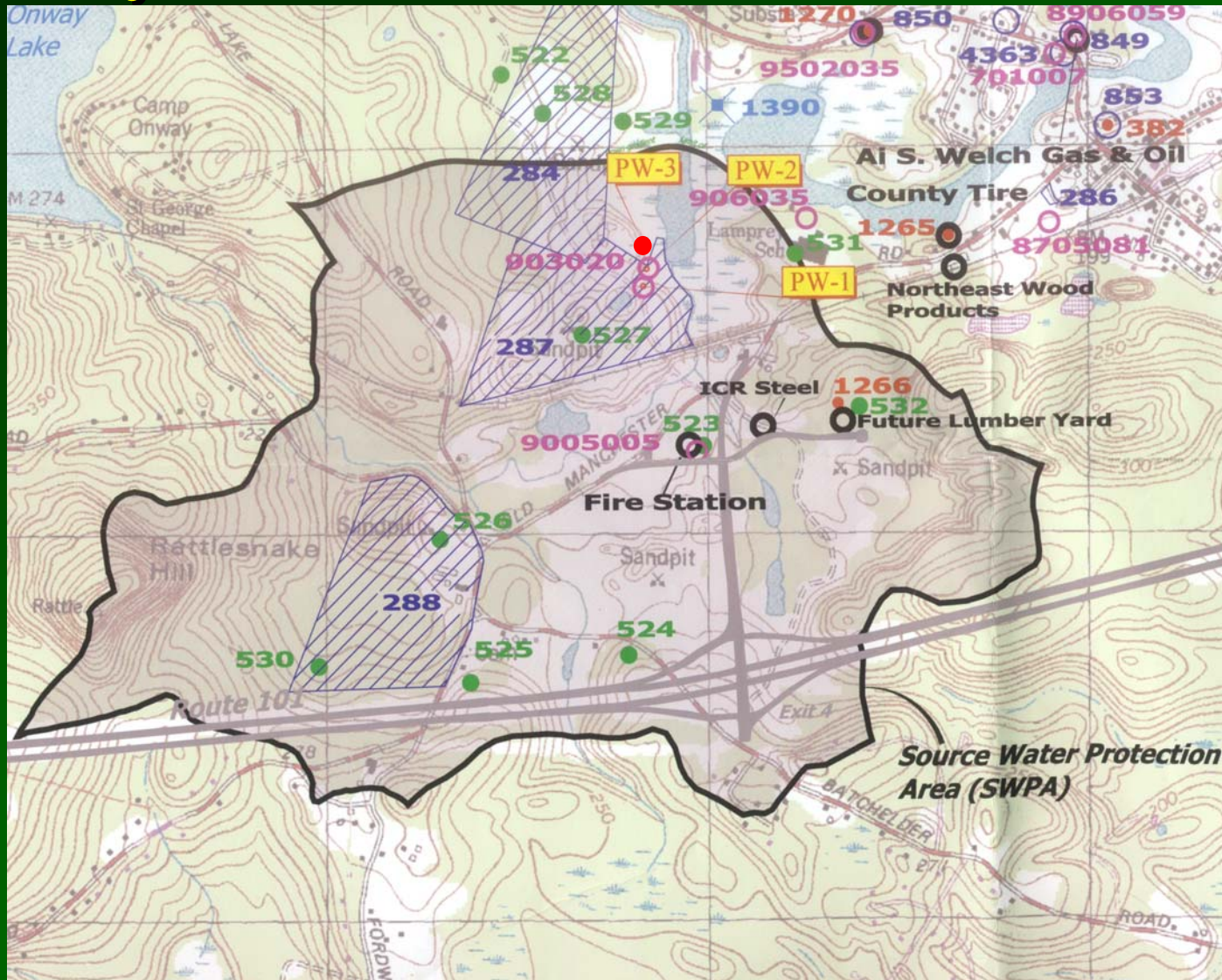
# Example of Delineating a Capture Zone/ Wellhead Protection Area New Well PW-3 – Pumping Conditions



# Example of Delineating a Capture Zone/ Wellhead Protection Area - New Well PW-3



# Example of Delineating a Capture Zone/ Wellhead Protection Area - New Well PW-3 Inventory of Potential Contamination Sources



# Wellhead Protection Area - New Well PW-3

## Inventory of Potential Contamination Sources

### MAP SYMBOLS

1269

### Hazardous Waste Generators (RCRA)

| ID # | Company                           | Address              |
|------|-----------------------------------|----------------------|
| 382  | NEW ENGLAND TELEPHONE CENTRAL OFF | FLORAL AVE           |
| 1256 | J C R CONSTRUCTION CO             | BUSINESS RT 101      |
| 1265 | COUNTY TIRE                       | 25 OLD MANCHESTER ST |
| 1266 | PIKE INDUSTRIES INC               | OLD MANCHESTER RD    |
| 1269 | METROPOLITAN FOODS                | 135 MANCHESTER RD    |
| 1270 | SPOT LIGHT CAR CARE               | 150 RTE 27           |
| 1271 | CAFMEYER BOB                      | 194 RTE 27           |

Facilities which are registered under the Federal Resource Conservation and Recovery Act (RCRA). Facilities listed under RCRA do not have to have any suspicion of chemical releases; they are only potential contaminant threats because they handle hazardous materials.



### MAP SYMBOL

302

### Non-Point Contaminant Sources

| ID  | Type | Name              | Address             | Town    | Status    |
|-----|------|-------------------|---------------------|---------|-----------|
| 284 | MS   | MIDWAY EXCAVATORS | CIDER FERRY ROAD    | RAYMOND | abandoned |
| 286 | SN   |                   | OLD MANCHESTER ROAD | RAYMOND | active    |
| 287 | MS   |                   | ONWAY LAKE ROAD     | RAYMOND | active    |
| 288 | MQ   | MIDWAY EXCAVATORS | OFF SCRIBNER        | RAYMOND | active    |

This coverage was developed as a joint effort between the New Hampshire Department of Environmental Services (NHDES), the Office of State Planning, and the nine Planning Commissions to map selected types of point and non-point potential pollution sources.

#### Non-Point Source Types - Key

| Type | Description           |
|------|-----------------------|
| MQ   | Mine, hardrock quarry |
| MS   | Mine, sand and gravel |
| SN   | Snow dump             |

○ 847

### Underground Storage Tanks

| ID # | Site Name              | Address    | Town    |
|------|------------------------|------------|---------|
| 842  | RAYMOND BAPTIST CHURCH | ROUTE 27   | RAYMOND |
| 847  | CARRIE L SMITH         | 99 MAIN    | RAYMOND |
| 849  | AI S WELCH & SONS INC  | 28 MAIN ST | RAYMOND |
| 850  | GETTY #55248           | RTE 101    | RAYMOND |
| 853  | BELL ATLANTIC          | FLORAL AVE | RAYMOND |
| 4363 | SHIRLEY C BAKER        | 27 MAIN ST | RAYMOND |

Registered underground storage tank site. Site does not indicate the presence of contamination.

# Wellhead Protection Area - New Well PW-3

## Inventory of Potential Contamination Sources(continued)

### MAP SYMBOL

● 531

### Local Inventory of Contaminant Sources

|     |                             |                       |     |                            |
|-----|-----------------------------|-----------------------|-----|----------------------------|
| 522 | CEMETERY                    | SUNDEEN PARKWAY       |     |                            |
| 523 | SAFETY COMPLEX              | 1 SCRIBNER RD         |     | police and fire depts      |
| 524 | TCB TOWING                  | 11 BATCHELDER RD      | VSR | towing service             |
| 525 | CEMETERY                    | GILE RD               |     |                            |
| 526 | MIDWAY SITE                 | SCRIBNER RD & GILE RD | EEE | quarry                     |
| 527 | CAMMETT RECREATION FIELD    | CIDER FERRY RD        |     |                            |
| 528 | MIDWAY PIT                  | CIDER FERRY RD        | EEE | gravel pit                 |
| 529 | TURCOTTE PIT                | CIDER FERRY RD        | EEE | gravel pit                 |
| 530 | MIDWAY SITE                 | GREEN RD              | EEE | quarry                     |
| 531 | LAMPREY RIVER ELEMENTARY RD | OLD MANCHESTER RD     |     | school                     |
| 532 | PIKE INDUSTRIAL             | 4 INDUSTRIAL DR       | CAT | asphalt (out of business)  |
| 540 | JC REED                     | 181 ROUTE 27          | VSR | vehicle parking and repair |
| 544 | RAYMOND ANIMAL HOSPITAL     | 169 ROUTE 27          | LAB |                            |

This coverage was developed by the Water Supply Engineering Bureau for use by the Source Water Protection Program.

### Key to Site Type Codes

| Site Type   | Code | Description   |
|---|------|---|
| Concrete, Asphalt & Tar Manufacture                         | CAT  | Concrete and asphalt plants   |
| Fueling & Maintenance of Excavation & Earthmoving Equipment | EEE  | Active gravel pits; construction businesses with earthmoving or excavating equipment stored and maintained on site.   |
| General Service & Repair Shops                              | GSR  | Furniture stripping, painting & refinishing; photographic processing; printing; appliance & small engine repair; boat repair; refrigeration, heating, ventilating & A.C. shops; electrical repair shops |
| Laboratories & Professional Services                        | LAB  | Medical, dental, veterinary offices; research, development, testing & analytical labs; funeral services; camera & photographic supply stores  |
| Vehicle Service & Repair Shops                              | VSR  | Auto, truck & equipment service or repair shops, autobody shops including those associated with fleet maintenance; mobile home dealers  |
| Waste & Scrap Processing & Storage                          | WSPS | Junkyards, scrap yards & auto salvage yards; wastewater (ww) treatment plants; dumps, landfills, transfer stations & other solid waste facilities; ww or septage lagoons                                |

# Well Approval

An new source application which meets the requirements of the rules such that it is demonstrated it will be capable of consistently producing an adequate supply of water that meets drinking water quality standards will be approved.

Conditions of approval include:

- 1) Long term water quality monitoring requirements.
- 2) Implementation of Inspections of Potential Contamination Sources in the WHPA for compliance with Groundwater Protection BMPs (Env-Ws 421).

# Best Management Practices (BMP) for Groundwater Protection (Env-Ws 421)

Objectives of the BMP rules:

- ◆ Regulate Material Handling and Storage
- ◆ Prevent Releases
- ◆ Do Not Prohibit Activities or Use of Materials
- ◆ Apply to All Facilities in NH that use more than household quantities (> 5 gallons) of regulated substances

# Summary of BMP Rules - Storage

- ◆ Store regulated substances on an impervious surface.
- ◆ Secure storage areas against unauthorized entry.
- ◆ Inspect storage areas weekly.
- ◆ Cover regulated containers\* in outside storage areas.
- ◆ Keep regulated containers, stored outside, more than 50 feet from surface water, 75 feet from private wells, and up to 400 feet from public wells.
- ◆ Secondary containment is required for regulated containers stored outside, except for on-premise use heating tanks, or aboveground or underground storage tanks otherwise regulated.
- ◆ Keep regulated containers at least 50 feet from storm drains, if no secondary containment.
- ◆ Label regulated containers clearly and visibly.

# Summary of BMP Rules - Handling

- ◆ Keep regulated containers closed and sealed.
- ◆ Place drip pans under spigots, valves, and pumps.
- ◆ Have spill control and containment equipment readily available.
- ◆ Use funnels and drip pans when transferring regulated substances; perform transfers over impervious surface.

# Other Applications of the Groundwater Protection BMP Rules

- ◆ Water System Chemical Monitoring Sampling Waivers
- ◆ Groundwater Reclassification – Municipalities can administer the BMP Rules
- ◆ Local Ordinance - Municipalities can administer the BMP Rules

Forms, sample letters, and flow charts for completing BMP Inspections are available in publications from the Department

\*\*\*On-site training for BMP Inspection is available from the Department\*\*\*

# Large Groundwater Withdrawal Permitting (Env-Ws 387 and 388) ([www.des.state.nh.us/dwspp/lgwith.htm](http://www.des.state.nh.us/dwspp/lgwith.htm))

## Prior to 1998.....

- ◆ Drill Well
- ◆ Pump Water
- ◆ If problems occur, negotiate or go to Court

# Until Recently...

- ◆ Property owners under riparianism had the right to use a reasonable amount of water
- ◆ Any impacted party would need to prove impact to the court or rely on the State to pursue resolution as a public trustee
- ◆ “Impact” was not defined
- ◆ Uncertainty about when public trust came into play

# Today

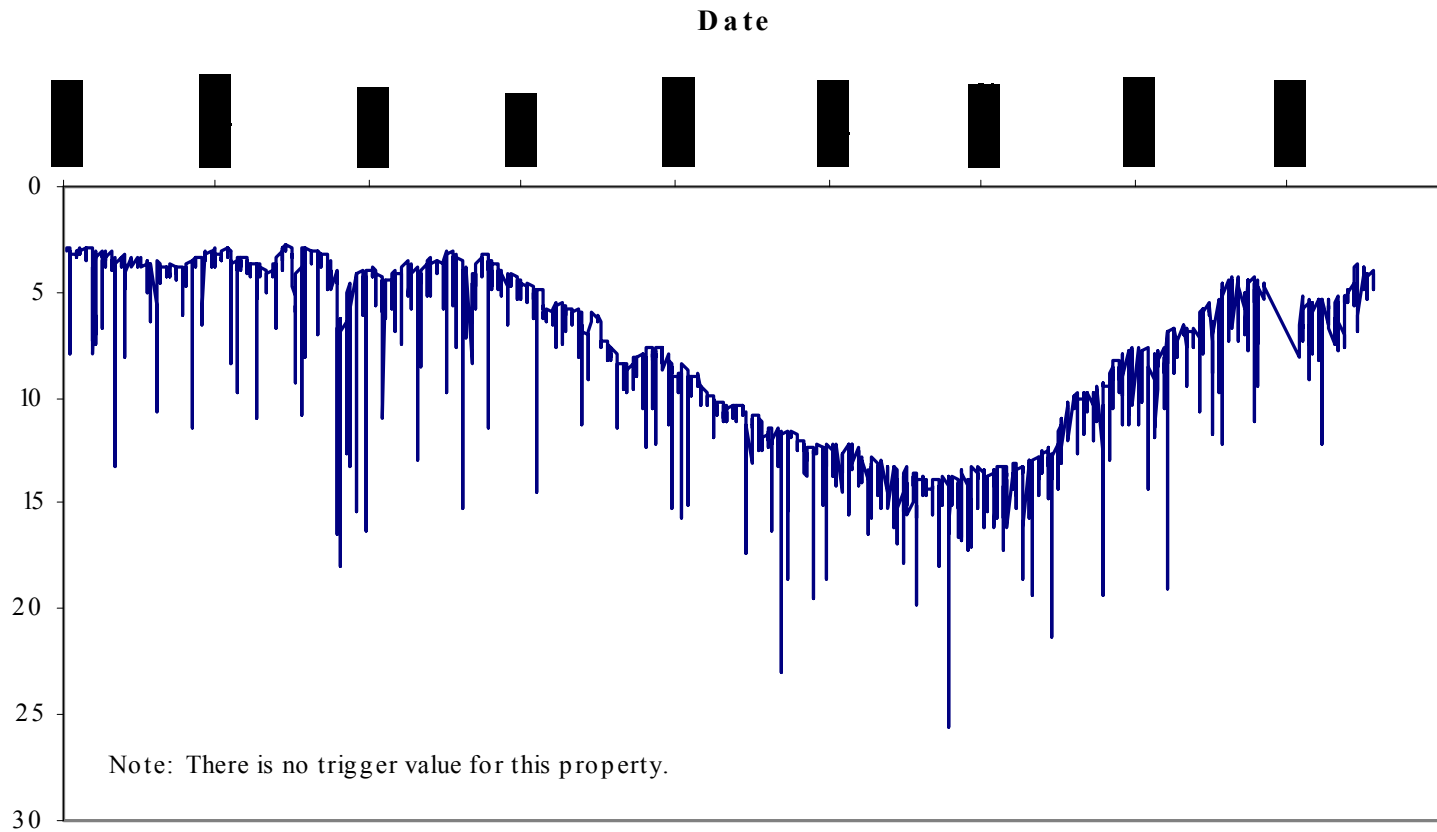
- ◆ DES must assess impacts when a withdrawal that will exceed 57,600 gallons/24-hour period is proposed
- ◆ No permit is given if adverse impacts will occur
- ◆ At any time an adverse impact happens the applicant is responsible for mitigation
- ◆ Permits are for 10 years
- ◆ Clear process to understand local concerns and address all valid concerns during permitting
- ◆ Water use efficiency must be demonstrated

# Regional Impacts of Groundwater Withdrawals

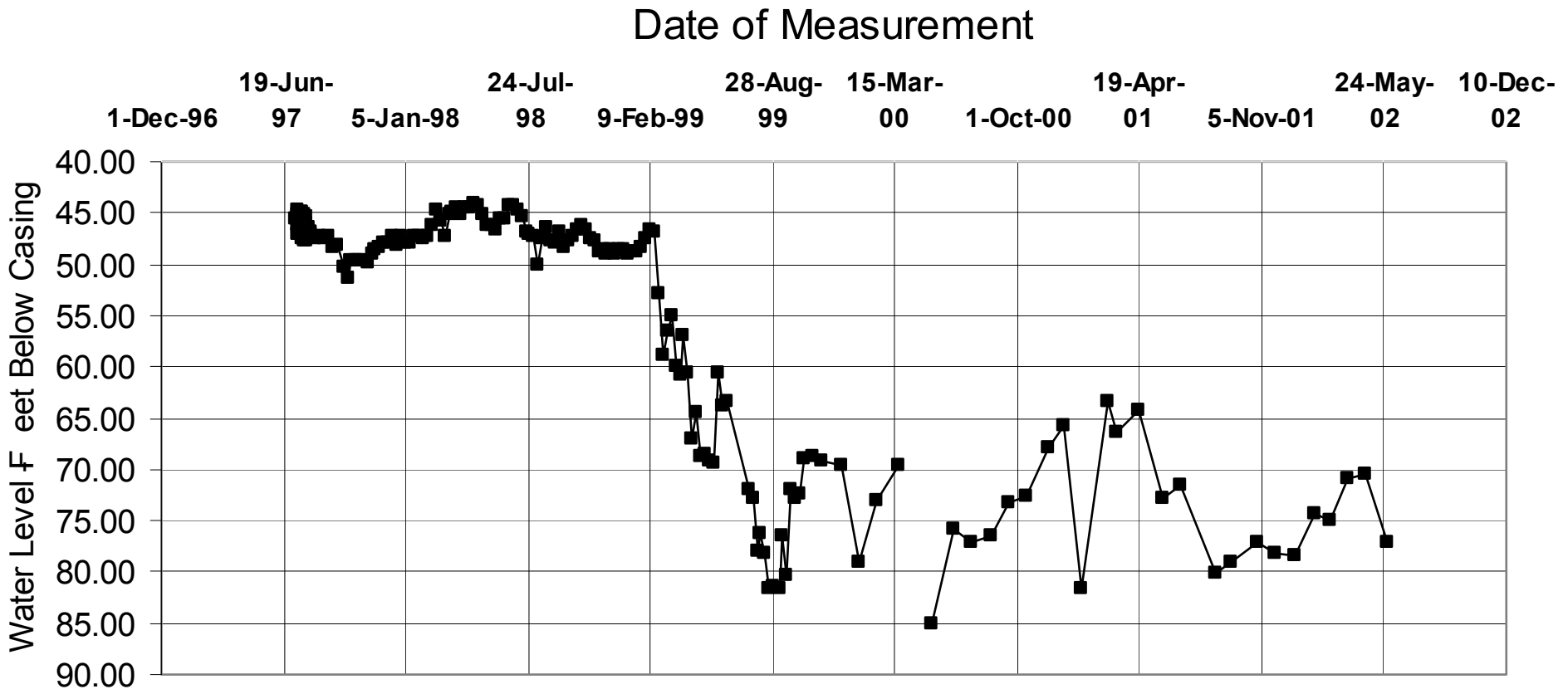
Impacts that Occasionally Occur Include:

- ◆ Private well impacts (well dewatering)
- ◆ Impacts to surface water bodies (wetlands, ponds, streams)
- ◆ Water Quality

# Example of Seasonal Impacts (golf course pumping during summer)



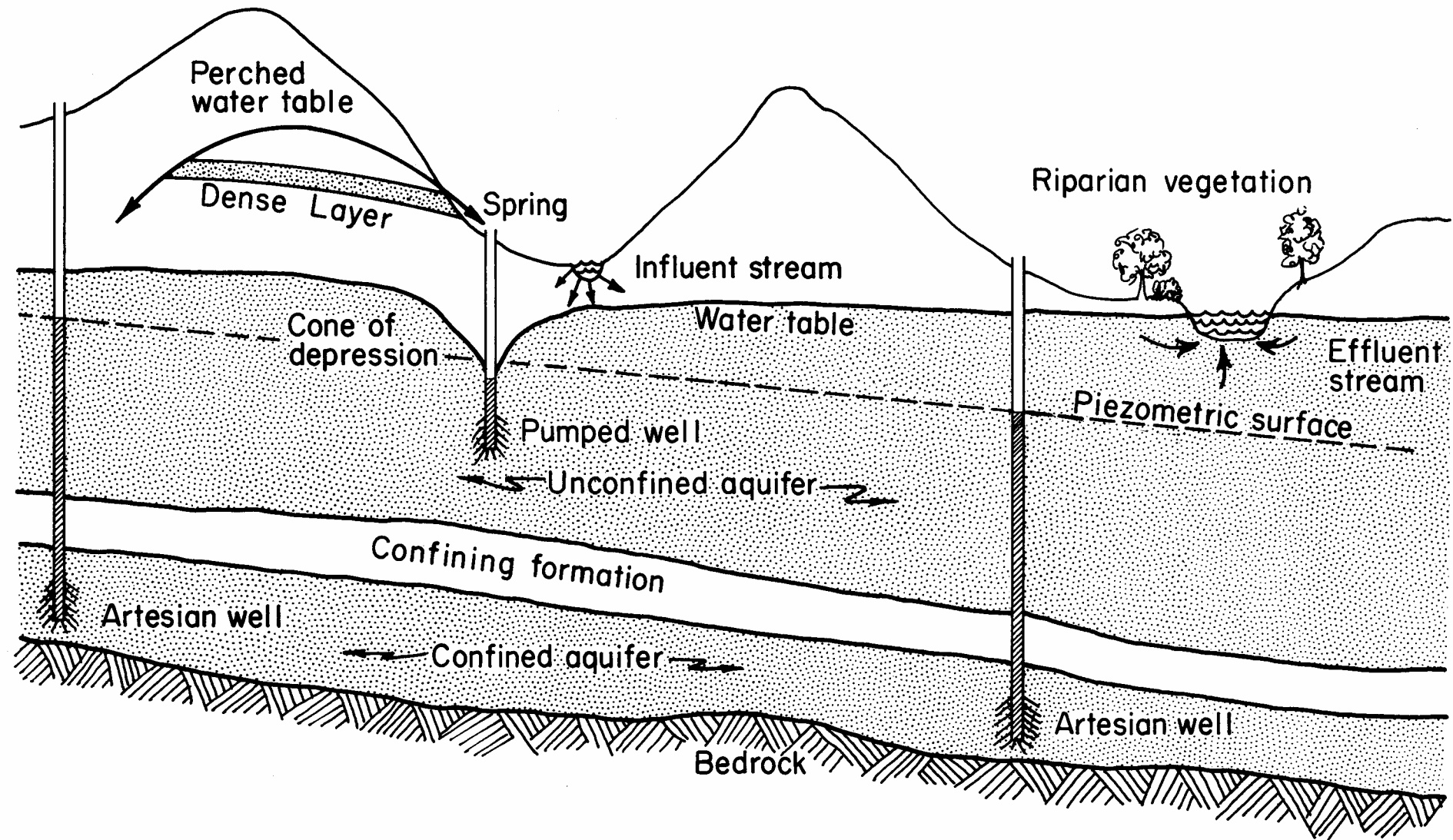
# Example of Continuous Pumping Public Water Supply Wells Near Residential Wells



# Ground-Surface Water Interaction

- ◆ Different flow systems can exist in a given region all influencing surface water in different ways – very complex.
- ◆ Surface water bodies interact with groundwater on a regional level in several ways: gaining, losing, gaining and losing, perched and flow through.

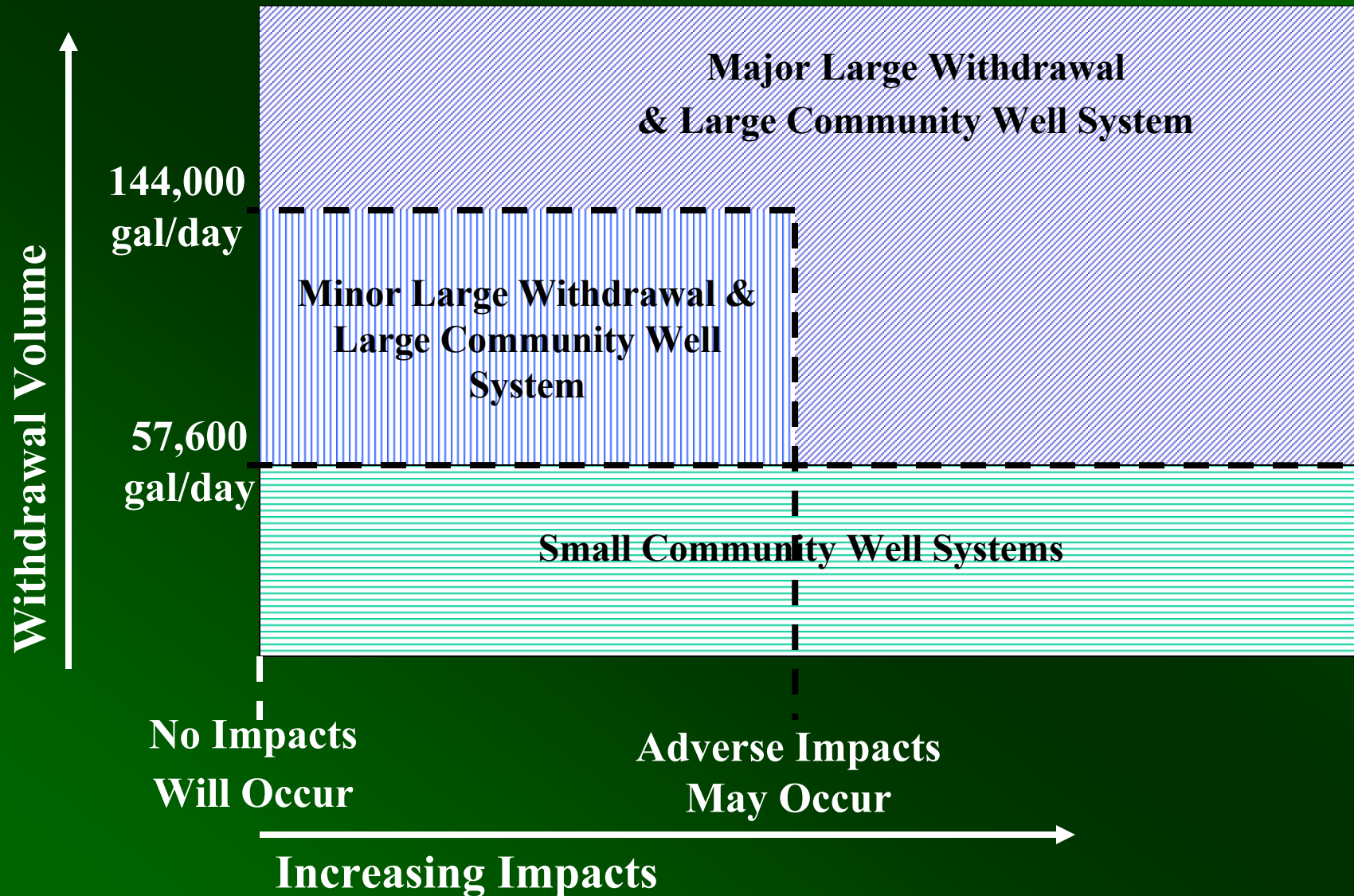
# Subsurface Hydrology



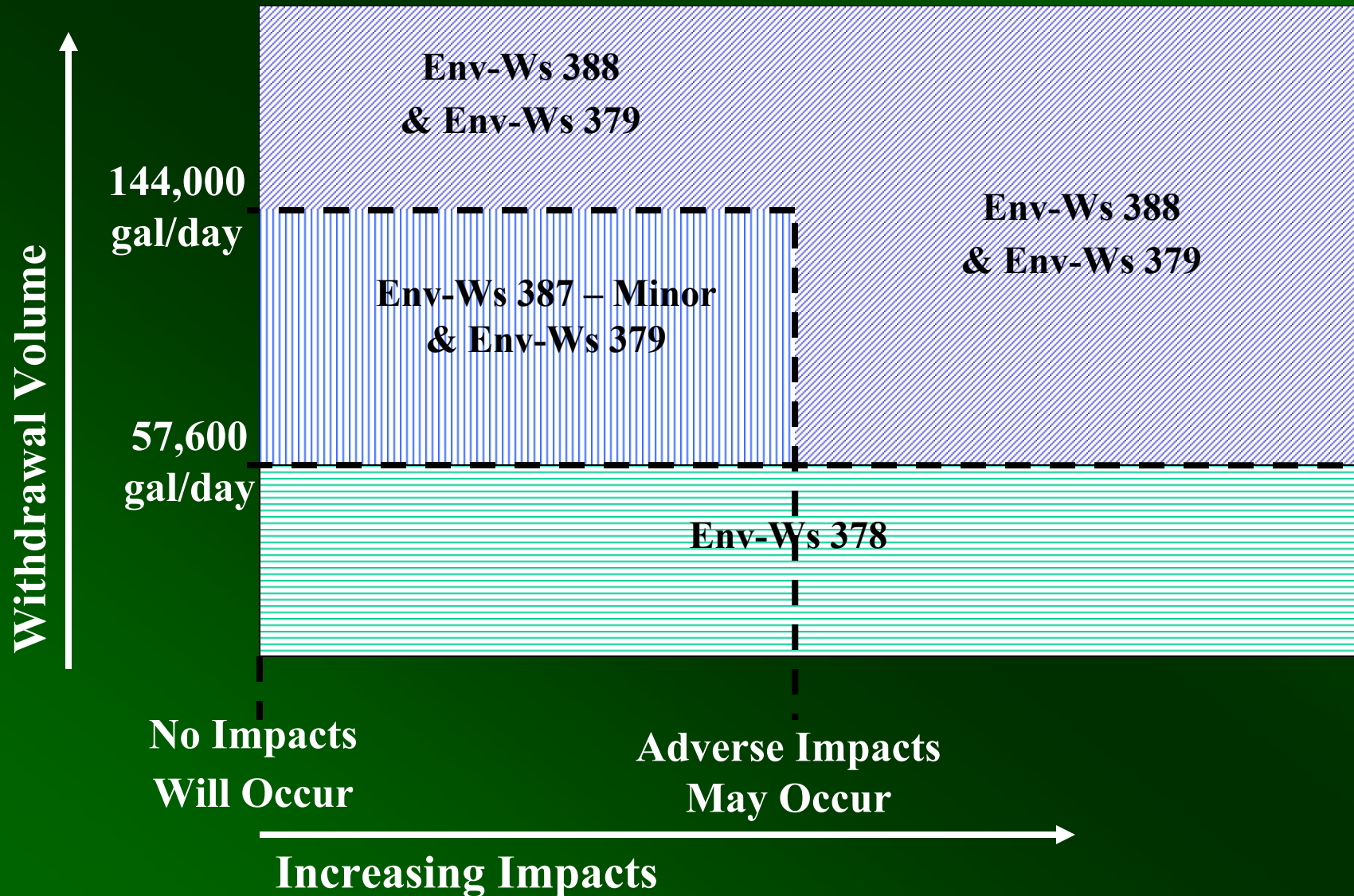
# Typical Functions and Values of Wetlands Protected Under the Large Groundwater Withdrawal Permitting Process

- ◆ Groundwater Recharge/Discharge
- ◆ Flood Flow Alteration
- ◆ Fish and Shellfish Habitat
- ◆ Sediment Retention
- ◆ Nutrient Removal
- ◆ Food Production
- ◆ Wildlife Habitat
- ◆ Shoreline Stabilization
- ◆ *Recreation*
- ◆ *Educational*
- ◆ *Uniqueness/Heritage*
- ◆ *Aesthetics*
- ◆ *Endangered Species Habitat*

# DETERMINING WHICH GROUNDWATER WITHDRAWAL REGULATIONS APPLY



# DETERMINING WHICH GROUNDWATER WITHDRAWAL REGULATIONS APPLY



# The Groundwater Discharge Permitting and Registration Program (Env-Ws 1500)

- ◆ Requires proper treatment and disposal of wastewater onto or into the ground.
- ◆ Focus is to eliminate instances where groundwater has been contaminated by the improper disposal of waste and wastewater containing solvents, petroleum products and other industrial and commercial wastes.
- ◆ All discharges of non-domestic wastewater to the ground must be registered with, and in some cases permitted by, DES.
- ◆ State regulations (Env-Ws 1500) prohibit any discharge of non-domestic wastewater containing regulated contaminants above ambient groundwater standards and without treatment by BMP technology.

# **Groundwater Discharge Registration**

## **(Env-Ws 1508)**

**Discharges of non domestic wastewater onto or into the ground which does not contain a regulated contaminant, including but not limited to, underground injection must be registered.**

**Purpose of Groundwater Discharge Registration:**

- 1) Confirms discharge is completed properly;**
- 2) Identifies locations of groundwater discharges (NH GIS coverage); and**
- 3) Facilitates educational outreach and inspection opportunities**

**Groundwater Discharge Registration form:**

**[www.des.state.nh.us/pdf/floorreg.pdf](http://www.des.state.nh.us/pdf/floorreg.pdf)**

**Regulated Contaminants are listed in Env-Ws 1500:**

**[www.des.state.nh.us/rules/ws1500.pdf](http://www.des.state.nh.us/rules/ws1500.pdf)**

# Floor Drains and Holding Tank (Env-Ws 1508.02 & 1508.03)

- ◆ Floor drains in areas where regulated substances are used or stored must:
  - (a) Be permanently sealed; or
  - (b) Discharge into a registered holding tank
- ◆ A holding tank registration is required for the use of holding tanks which receive flow from floor drains or other conduits in areas where regulated substances are used or stored.

# Groundwater Discharge Permitting (Env-Ws 1504)

A groundwater discharge permit must be obtained for the following activities:

- (1) The construction and operation of an unlined wastewater, septage or sludge lagoon;
- (2) Land treatment of wastewater;
- (3) The discharge onto or into the ground of nondomestic wastewater which contains a regulated contaminant and which has received treatment by best available technology before discharge; and
- (4) The discharge of domestic wastewater from a subsurface disposal system with a design flow equal to or greater than 20,000 gallons per day.

# Groundwater Discharge Permitting (continued)

A groundwater discharge permit requires

- ◆ Hydrogeologic study
- ◆ Requires the establishment of a groundwater discharge zone that is owned or legally controlled by the permittee
- ◆ Monitoring well network and routine water level and water quality sampling
- ◆ \$1000 application fee

A discharge may not cause groundwater quality standards to be exceeded or otherwise make groundwater undrinkable outside the groundwater discharge zone

# Who to Contact

- ◆ **Small Community Water System: Diana Morgan – 271-2947 or [dmorgan@des.state.nh.us](mailto:dmorgan@des.state.nh.us)**
- ◆ **Large Community Water System/Large Groundwater Withdrawal Permitting: Tim Nowack – 271-8866 or [tnowack@des.state.nh.us](mailto:tnowack@des.state.nh.us)**
- ◆ **Groundwater Protection BMPs: Diana Morgan - 271-2947 or [dmorgan@des.state.nh.us](mailto:dmorgan@des.state.nh.us)**
- ◆ **Groundwater Discharge/Holding Tanks Registration and Permitting: Mitch Locker – 271-2858 or [mlocker@des.state.nh.us](mailto:mlocker@des.state.nh.us)**

**Source Water Protection Website -  
[www.des.state.nh.us/dwspp/](http://www.des.state.nh.us/dwspp/)**